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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,841	08/09/2006	Min-Seok Song	3576-025	6977

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EXAMINER	
PARVINI, PEGAH	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,841	SONG ET AL.	
	Examiner	Art Unit	
	PEGAH PARVINI	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *1-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/9/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Applicant's election of Group II, claims 16-29 in the reply filed on 3/1/09 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

DETAILED ACTION

Claim Objections

Claim 23 is objected to because of the following informalities: the ratio represented in claim 23, based on the description provided in said claim, should be "w/a" not "w/s". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,039,641 to Sung.

Sung teaches a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond particles and diamond braze (i.e. bonding material) (Abstract; column 14, lines

20-25, 35-40). This structure can be found in Fig. 7A and 7B; as noted the upper end edge is rounded.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,611,326 to Caspani et al.

Caspani teaches a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond bodies (see figure 3).

Caspani et al., drawn to diamond-set insert carrier tool, clearly teach abrasive bodies in concave shapes which contain abrasive particles and are spaced close to each other on substrate or support (i.e. shank) (Figure 3, Abstract; column 3). Although the reference may not expressly disclose that the ratio of the spacing between the concave portions to the width of the concave portions is within a range of 0.2 to 0.8, it is apparent from the figures that the width of the concave portions is almost twice than the spacing between the concave portions. Thus, this results in roughly a ratio of about 0.5. This is seen to read on the limitation of instant claims absence clear evidence showing why Caspani et al. may not want to have such a spacing.

Furthermore, the reference clearly discloses that the surface of the support to which the abrasive bodies are applied is shaped as an arc of a circle.

Claims 17-18, 23-25, and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung.

Sung, as noted above, disclose a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond particles and diamond braze (i.e. bonding material).

Furthermore, Sung teaches that the slots or holes can be formed to provide such columns which are linear or which curve in any desired direction (column 16, lines 24-26). Additionally, said diamond tool is used in cutting, drilling, etc. equipment as that has been made obvious by the reference (column 1, lines 5-26; column 16, lines 26-30). Moreover, since the reference discloses the use of diamond particles, this is taken to include any and all types of diamond particles including synthetic and natural (column 16, lines 3-10).

With reference to the ratio of the width of the concave portion to the maximum diameter of abrasive being greater than 0.25 and the ratio of the depth of the concave portion to the maximum diameter of the abrasive being greater than 0.25, it is apparent from Figure 7A and 7B, that said ratios are greater than 0.25 since more than one layer of diamond particles are fit into the slots (i.e. concave portions); thus, the depth of the concave portions is larger than the diameter of the diamond particles. Furthermore, since, taking any layer of diamond particles in the slots, a particle easily fits into a slot;

therefore, the width of the concave portion should be greater than that the maximum diameter of the abrasive.

Sung, additionally, discloses an embodiment wherein the diamond abrasive particles protrude from the support material (column 15, lines 45-50). Thus, although Sung may not expressly disclose such protrusion for the abrasive particles in the concave portion, the fact that said reference suggests the use of abrasive particles in a way that they protrude from the surface of the support would make it obvious that it would be known to a person or ordinary skill in the art to have obtained a tool with abrasives protruding from its surface; this broadly reads on the limitation of claim 25 specially noting that since only the slots contain abrasive particles and since Sung suggests particles protruding from the surface, therefore, it would be expected that the particles contained within the slots may have protrusions as well absence clear and specific evidence showing the contrary.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sung as applied to claim 16 above, in view of U.S. Patent No. 4,091,792 to Farrell.

Sung, as noted above, disclose a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond particles and diamond braze (i.e. bonding material).

Although Sung may not expressly disclose through-hole within the concave portion, it has been known and thus obvious to a person or ordinary skill in the art to

have through-holes since they assist in dissipating the heat generated during grinding/abrading work as that evidenced by Farrell (column 1, lines 33-42).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sung as applied to claim 16 above, in view of Farrell and U.S. Patent No. 4,624,237 to Inoue.

Sung, as noted above, disclose a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond particles and diamond braze (i.e. bonding material). Additionally, as shown above, Sung in view of Farrell make it obvious to have through-holes within the concave portions in order to assist in dissipating the heat generated during grinding/abrading work. It should be noted that the concave portion is in the sub-cutting face of the support material (i.e. shank).

Sung or Sung in view of Farrell do not expressly disclose the existence of grooves in a main cutting edge; although Sung makes it obvious that his tool is used in grinding and cutting, it does not disclose expressly show a structure of said devices with grooves. Nevertheless, formation of grooves on to an abrading wheel would have also been obvious to a person or ordinary skill in the art motivated by the fact that grooves would help in not only dissipating the heat generated by the grinding/abrading work and thus cooling the tool, but also, they provide a passage for the outflow of the abraded particles as that evidenced by Inoue (Abstract and claim 1).

Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung as applied to claim 16 above, in view of U.S. Patent No. 5,989,405 to Murata et al.

Sung, as noted above, disclose a diamond tool which comprises of opening slots (i.e. concave portions) in a support material (i.e. shank) wherein the opening slots are filled with diamond particles and diamond braze (i.e. bonding material). Additionally, Sung suggests that the abrasive diamond particles protrude from the surface as shown above.

Murata et al., drawn to a dresser (i.e. abrasive tool) which includes super-abrasives (e.g. diamond), disclose that the super-abrasive particles are protruded from the surface, and, as it's apparent from the figures, the protruding heights are different (Fig. 1 and 2). Murata et al., further, disclose that height of protrusion of particle is 5 to 30% of the average diameter of the particles (column 4, lines 45-60). Additionally, the reference discloses that this height range is the most effective height.

Therefore, it would have been obvious to a person of ordinary skill in the art to modify Sung in order to show abrasive particles protruding at different heights from the surface as that taught by Murata et al. motivated by the fact that this range of height for protrusion of super-abrasive particles in an abrasive tool is the most effective height in abrading work. It is to be noted that based on the teachings of Murata et al. it is found that making the particle protruding from the surface is well within the scope of a skilled artisan. Furthermore, although Murata et al. do not expressly refers to a concave or hole portion on an abrasive layer, Sung, as detailed out above, clearly meets said

limitation. Additionally, as obvious from the figures of Murata et al., the super-abrasive particles are protruded at different heights, and therefore, it is well within the scope of a skilled artisan to have modified Sung in order to show protrusions as different heights.

It should be noted that although the Figures provided by Sung may portray abrasive particles protruding at the same height, it is well seen and shown that said pictures are seen diagrams representing the general and broad teaching of that invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/
Examiner, Art Unit 1793

/Michael A Marcheschi/
Primary Examiner, Art Unit 1793